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Letter to the Editor

Interpretation of the results of multivariate analyses

To the Editor,

I read with great interest the article by Murakami et al. entitled "Evaluation of the impact of atrial fibrillation on rehospitalization events in heart failure patients in recent years" [1].

The authors concluded that the clinical impact of atrial fibrillation as a risk factor for rehospitalization due to congestive heart failure exacerbation was considered to have decreased in recent years and mentioned that no administration of β-blockers was the only independent risk factor for rehospitalization in the Cox hazard multivariate analysis. The study is interesting, but I believe that some comments regarding the results of the multivariate analysis are warranted.

They showed the results of univariate and multivariate analyses of the risk factors for rehospitalization in Table 2. They used the odds ratio as the statistical parameter, but in the Cox proportional hazard model, hazard ratio is usually used. (Odds ratio is used in the logistic regression model analysis.) The confirmation of the method of regression model adopted is firstly warranted.

Second, they also showed the 95% confidential interval (CI) of the odds ratio of the parameters. For example, odds ratio of age is 0.148 and its 95% CI is −0.062 to 0.0063 (Table 2). However both odds ratio and hazard ratio are quite unlikely to be negative values. I wonder 95% CI of what actually is shown. Third, they showed that non-administration of β-blocker was the only independent risk factor for rehospitalization. However the odds ratio is 0.614, indicating that non-administration of β-blocker inhibits the occurrence of the events. Finally, in the multivariate Cox proportion hazard model and multivariate logistic regression analysis, 1 variable per 10 events or more is strongly recommended [2]. In the present study, 17 variables per 99 events, i.e. 1 variable per 5.8 events was assigned. Since it may cause overfitting of statistical analysis, the number of independent variables should be reduced.

Thus, I hope the authors would reconsider the present results of multivariate analysis and perform the multivariate statistical analysis again.

Disclosure

None to disclose

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Author's reply

Referring to the letter from Dr. Kazumasa Tsukamoto, we have checked through the data of our previously published manuscript [1]. In the manuscript, we presented "estimated range of parameters" instead of "confidence interval of odds ratio" in Table 2, which is not commonly used. In accordance with the suggestion in the letter, we have checked through the data and methodology [2], and corrected the table.

Because the analysis was based on the same data, the results of the analysis and the conclusion were the same. We thank Dr. Tsukamoto for his kind comments and suggestion.

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